

Appendix A

Report No.:	CISRR240112067
FCC ID:	2BEJQ-S9
Product Name:	Bluetooth headset
Model No.:	S9
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Conducted Peak Output Power

Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-1.356	0.732	30	PASS
		39	-0.542	0.883		PASS
		78	-0.147	0.967		PASS
$\pi/4$ DQPSK	2-DH5	0	-0.843	0.824	20.97	PASS
		39	0.016	1.004		PASS
		78	0.556	1.137		PASS
8DPSK	3-DH5	0	-0.456	0.900		PASS
		39	0.213	1.050		PASS
		78	0.739	1.185		PASS

2) 99% Bandwidth

Test Result

Modulation	Channel	99% BW (MHz)
GFSK	0	0.85640
	39	0.88140
	78	0.90260
$\pi/4$ DQPSK	0	1.2040
	39	1.2090
	78	1.2050
8DPSK	0	1.2110
	39	1.2160
	78	1.2120

Test Graphs

GFSK_DH5_Channel 0

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		2.402 GHz	-8.36 dBm		
T1	1		2.4016077 GHz	-24.31 dBm	Occ Bw	856.4 kHz
T2	1		2.4024641 GHz	-24.52 dBm		

$\pi/4$ DQPSK_2-DH5_Channel 0

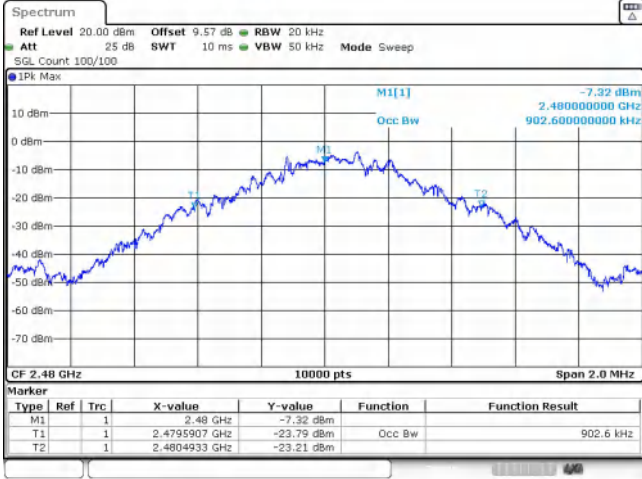
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		2.402 GHz	-11.53 dBm		
T1	1		2.4014405 GHz	-24.67 dBm	Occ Bw	1.2044 MHz
T2	1		2.4026449 GHz	-22.99 dBm		

GFSK_DH5_Channel 39

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		2.441 GHz	-7.56 dBm		
T1	1		2.4405985 GHz	-22.42 dBm	Occ Bw	881.4 kHz
T2	1		2.4414799 GHz	-24.35 dBm		

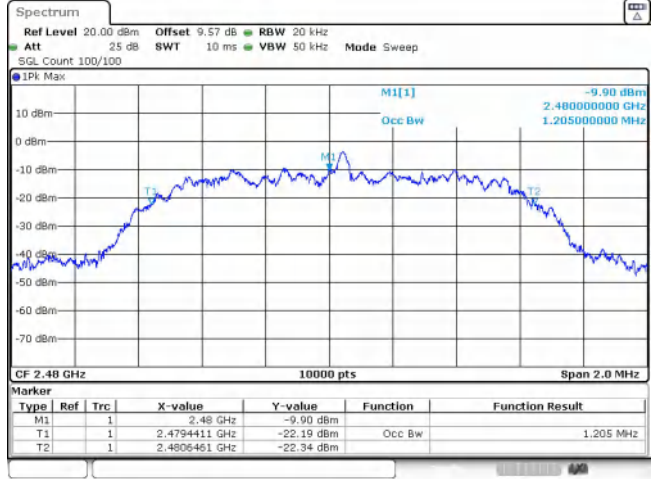
$\pi/4$ DQPSK_2-DH5_Channel 39

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		2.441 GHz	-12.15 dBm		
T1	1		2.4404389 GHz	-23.56 dBm	Occ Bw	1.2092 MHz
T2	1		2.4416481 GHz	-23.31 dBm		



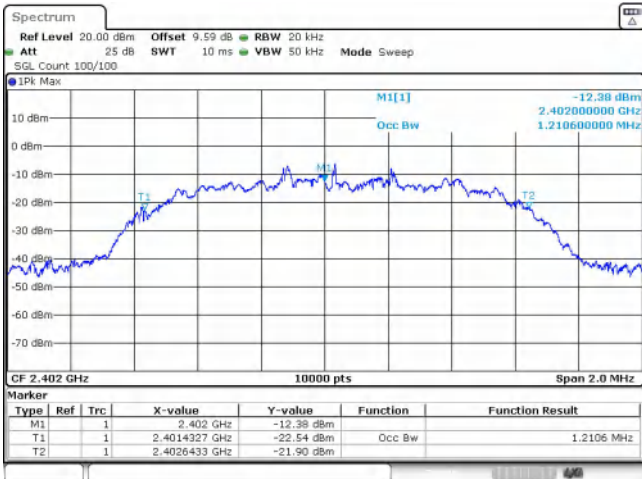
Date: 17.JAN.2024 15:51:00

GFSK_DH5_Channel 78



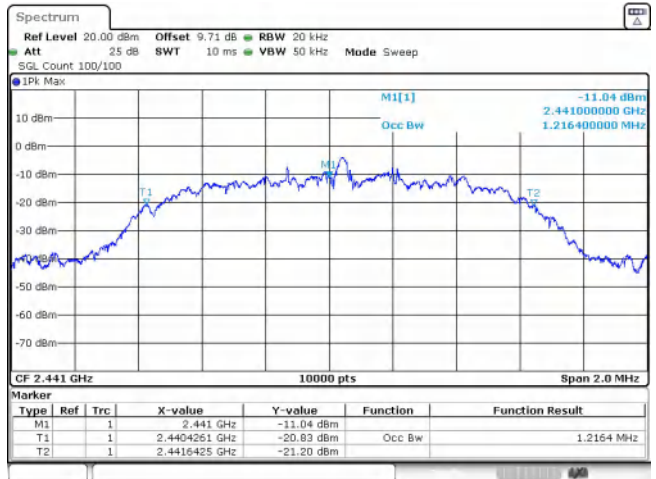
Date: 17.JAN.2024 15:57:50

$\pi/4$ DQPSK_2-DH5_Channel 78



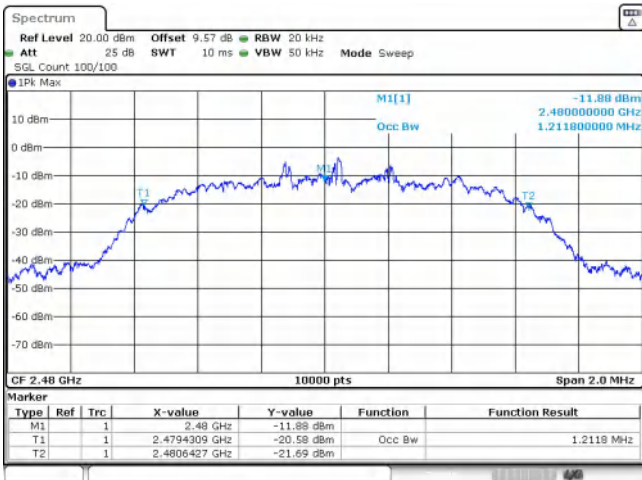
Date: 17.JAN.2024 16:04:20

8DPSK_3-DH5_Channel 0



Date: 17.JAN.2024 16:06:34

8DPSK_3-DH5_Channel 39



Date: 17.JAN.2024 16:08:58

8DPSK_3-DH5_Channel 78

Void

3) 20dB Bandwidth

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9500
	39	2441 MHz	1.000
	78	2480 MHz	1.020
$\pi/4$ DQPSK	0	2402 MHz	1.300
	39	2441 MHz	1.320
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.300

Test Graphs

GFSK_DH5_Channel 0

GFSK_DH5_Channel 39

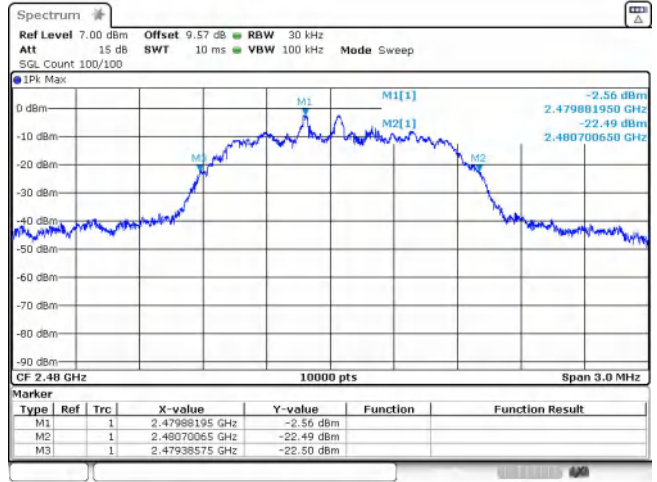
GFSK_DH5_Channel 78

$\pi/4$ DQPSK_2-DH5_Channel 0



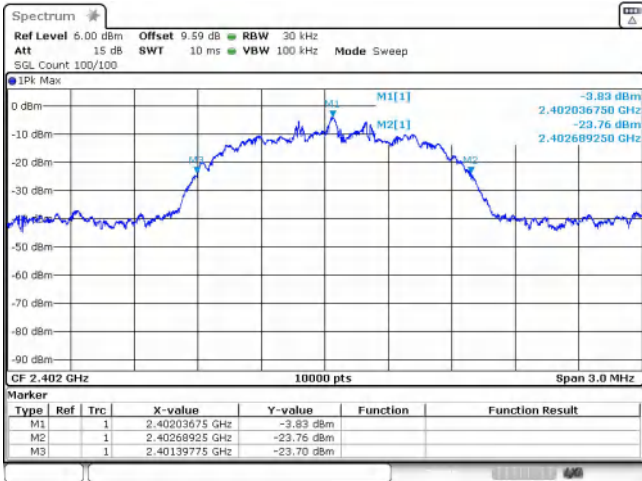
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$\pi/4$ DQPSK_2-DH5_Channel 39



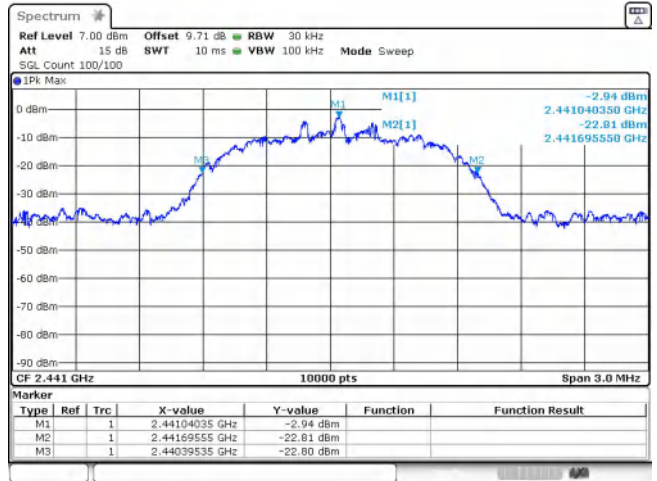
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$\pi/4$ DQPSK_2-DH5_Channel 78



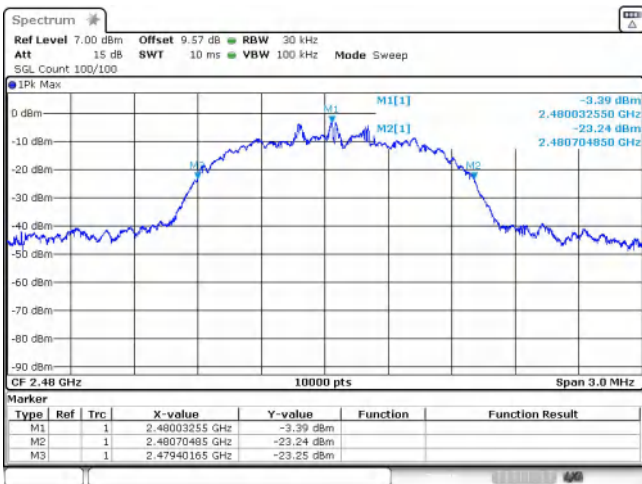
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8DPSK_3-DH5_Channel 0



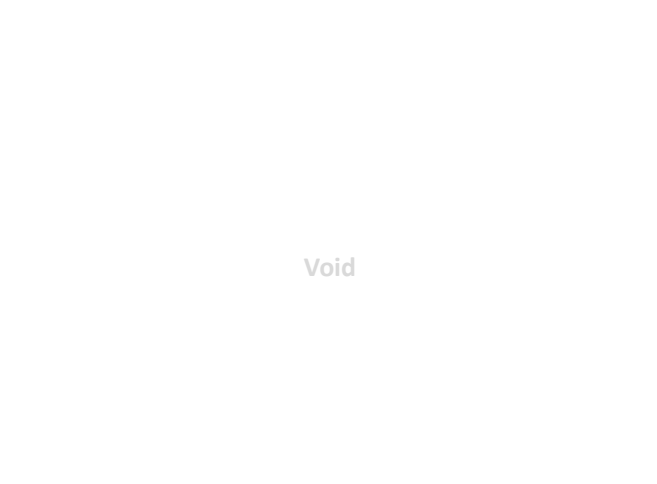
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8DPSK_3-DH5_Channel 39



Date: 17.JAN.2024 16:10:44

8DPSK_3-DH5_Channel 78

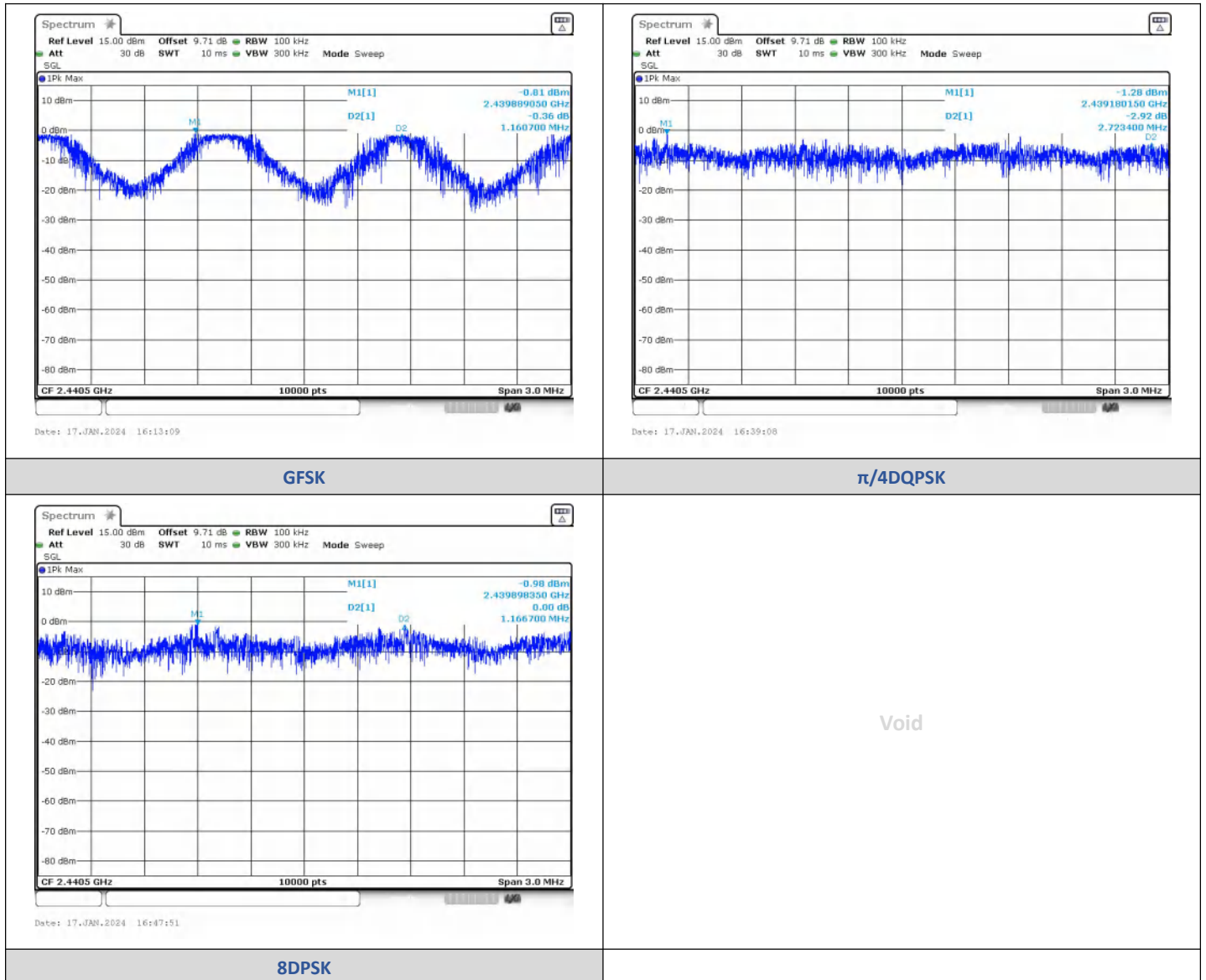


4) Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8891	2441.0498	1.1607	0.633	PASS
$\pi/4$ DQPSK	2-DH5	2439.1802	2441.9035	2.7234	2.0	PASS
8DPSK	3-DH5	2439.8983	2441.0651	1.1667	0.86	PASS

Test Graphs



5) Conducted Out Of Band Emission

Test Result

Non-Hopping

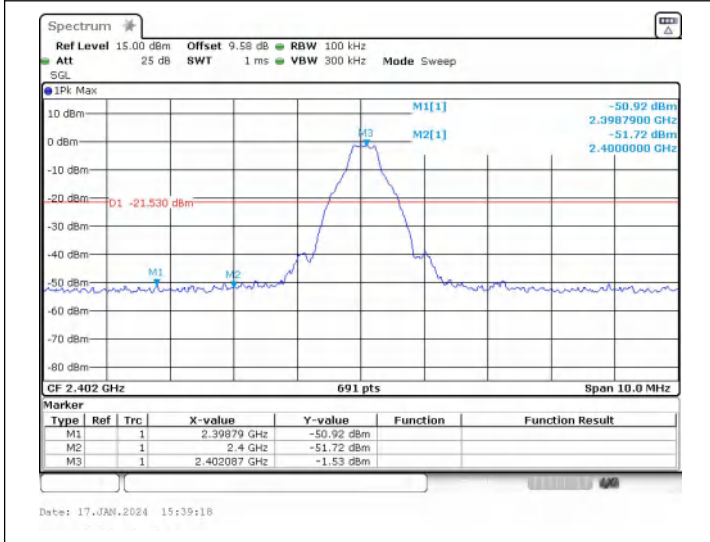
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	
GFSK	DH5	0	2400.00	-51.716	-21.53	-30.186	PASS	
			2398.79	-50.925	-21.53	-29.395	PASS	
			7206.80	-39.306	-21.53	-17.776	PASS	
		39	1943.95	-38.147	-20.59	-17.557	PASS	
			78	2483.50	-51.283	-20.24	-31.043	PASS
				9920.20	-42.778	-20.24	-22.538	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-52.630	-21.5	-31.130	PASS	
			2398.18	-50.755	-21.5	-29.255	PASS	
			7206.00	-42.932	-21.5	-21.432	PASS	
		39	9764.55	-39.644	-20.7	-18.944	PASS	
			78	2483.50	-51.873	-20.26	-31.613	PASS
				9920.20	-43.205	-20.26	-22.945	PASS
8DPSK	3-DH5	0	2400.00	-51.742	-21.57	-30.172	PASS	
			2398.54	-51.013	-21.57	-29.443	PASS	
			7206.00	-43.277	-21.57	-21.707	PASS	
		39	9764.55	-39.433	-20.54	-18.893	PASS	
			78	2483.50	-51.352	-20.35	-31.002	PASS
				9920.20	-43.368	-20.35	-23.018	PASS

Hopping

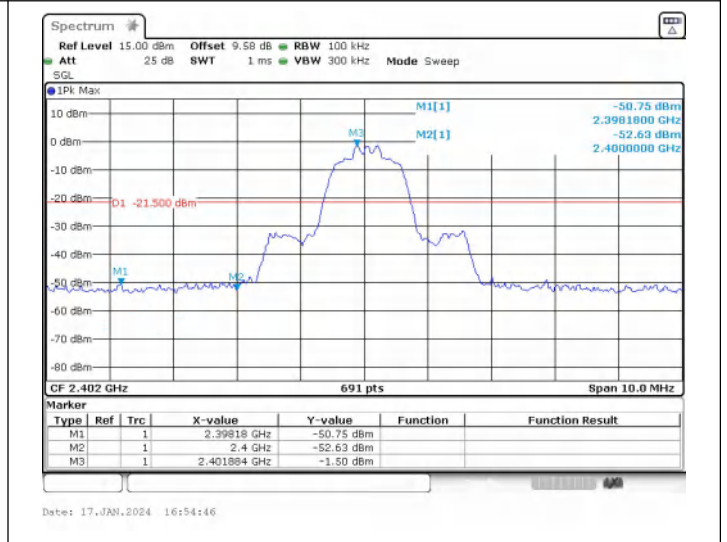
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.51	-50.247	-21.47	-28.777	PASS
			2400.00	-52.729	-21.47	-31.259	PASS
			2483.50	-53.035	-20.69	-32.345	PASS
			2397.13	-49.931	-21.67	-28.261	PASS
			2400.00	-51.481	-21.67	-29.811	PASS
			2483.50	-52.137	-20.27	-31.867	PASS
$\pi/4$ DQPSK	2-DH5		2398.47	-50.313	-21.7	-28.613	PASS
			2400.00	-52.754	-21.7	-31.054	PASS
			2483.50	-52.650	-21.75	-30.900	PASS
			2395.34	-50.542	-21.62	-28.922	PASS
			2400.00	-51.943	-21.62	-30.323	PASS
			2483.50	-52.634	-24.34	-28.294	PASS
8DPSK	3-DH5	2398.49	-50.606	-22.39	-28.216	PASS	
		2400.00	-53.004	-22.39	-30.614	PASS	
		2483.50	-51.136	-21.2	-29.936	PASS	

			2396.93	-50.353	-23.93	-26.423	PASS
			2400.00	-52.114	-23.93	-28.184	PASS
			2483.50	-52.781	-21.07	-31.711	PASS

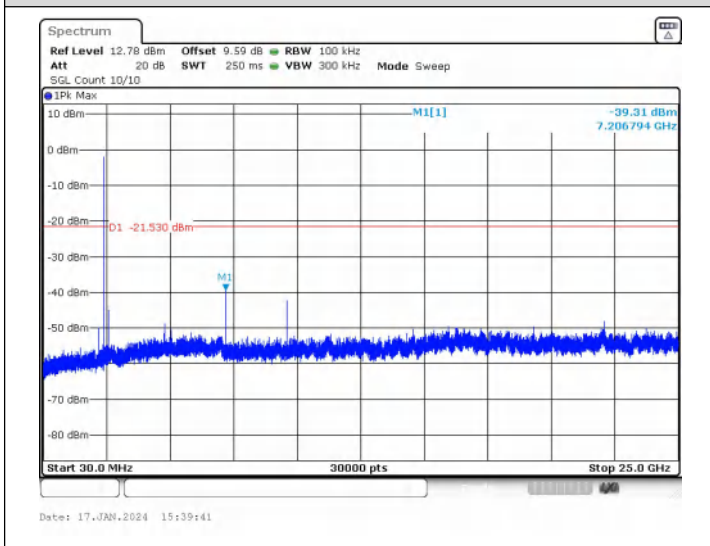
Test Graphs



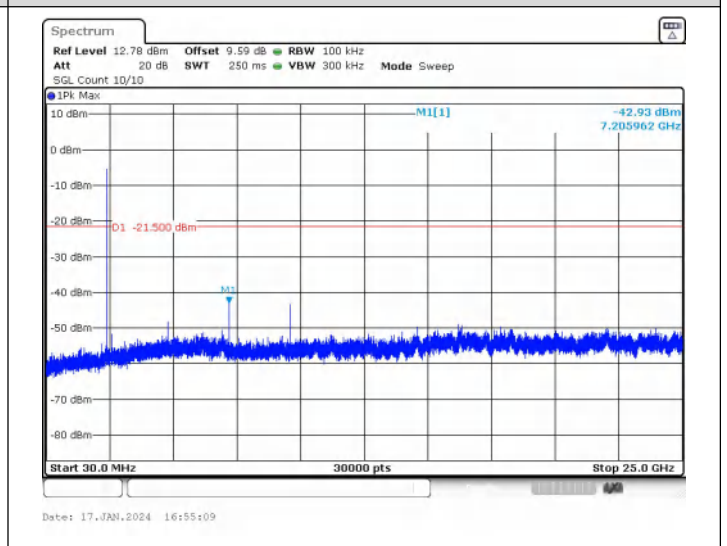
Out Of Band Emission
GFSK_DH5_Channel 0



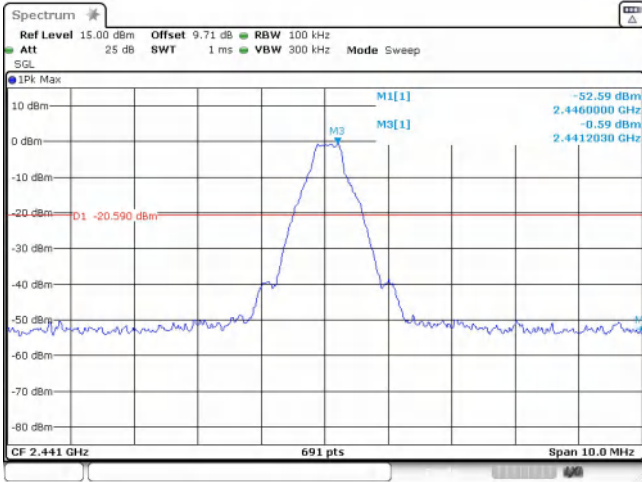
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



Spurious Emission
GFSK_DH5_Channel 0

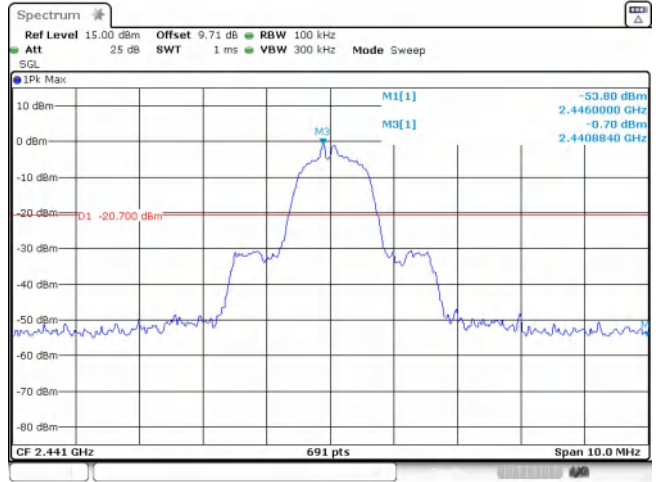


Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



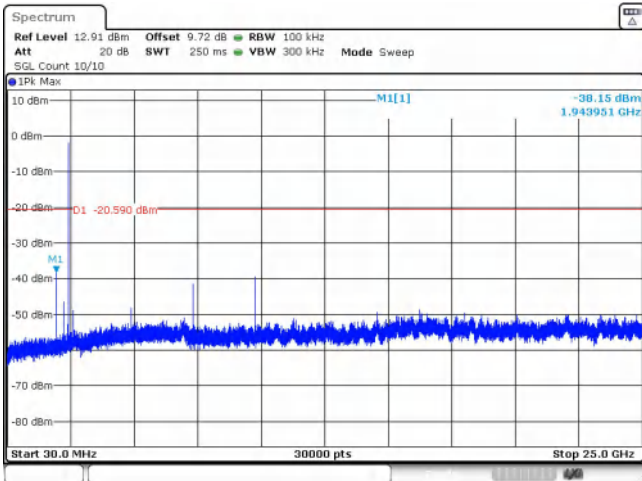
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Out Of Band Emission
GFSK_DH5_Channel 39



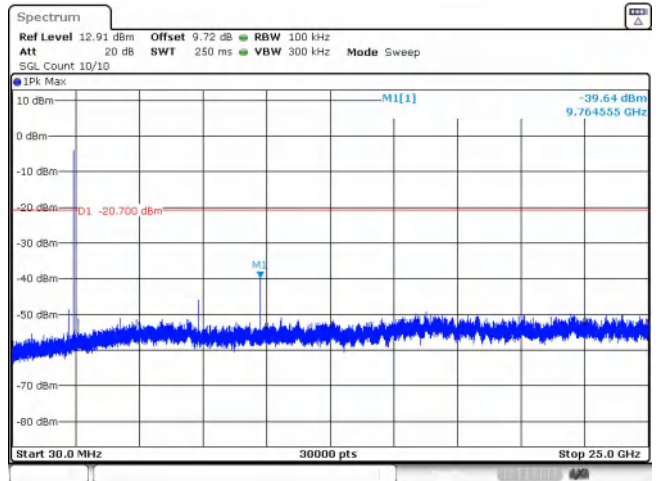
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



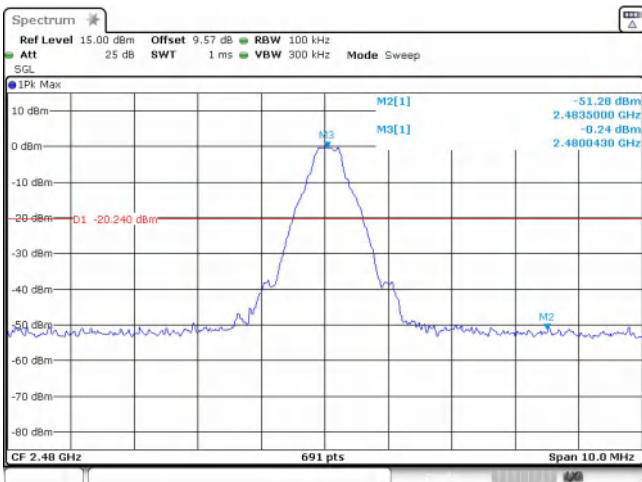
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Spurious Emissions
GFSK_DH5_Channel 39



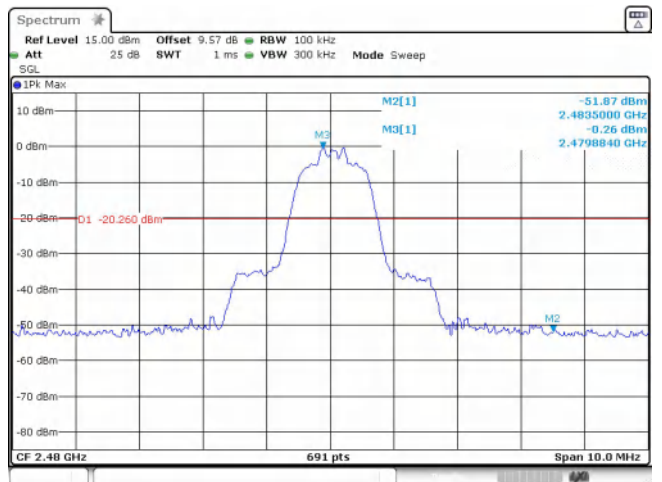
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Spurious Emissions
 $\pi/4$ DQPSK_2-DH5_Channel 39



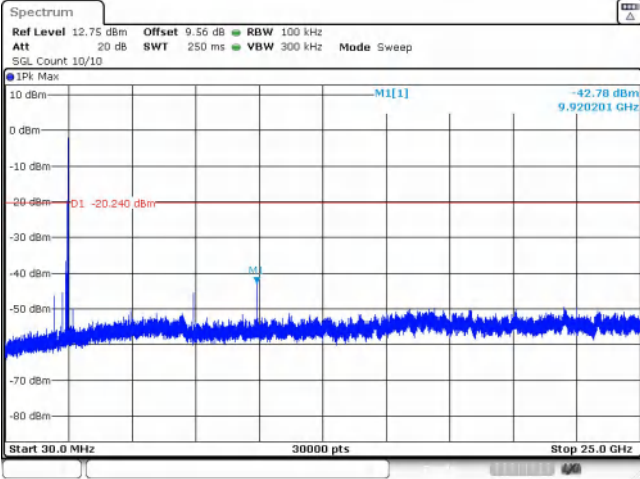
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Out Of Band Emission
GFSK_DH5_Channel 78



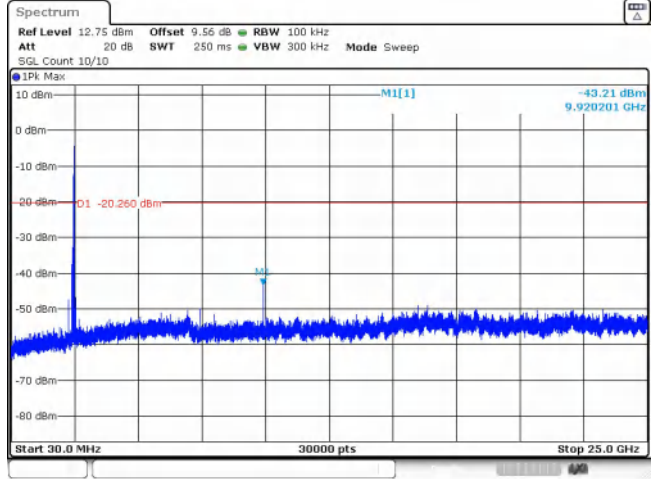
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



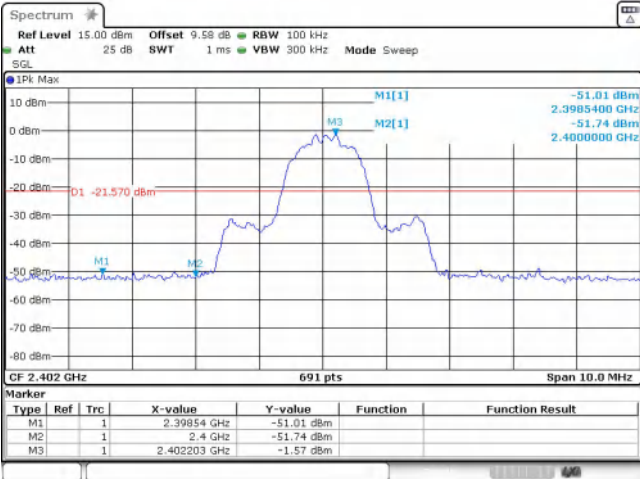
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Spurious Emission
GFSK_DH5_Channel 78



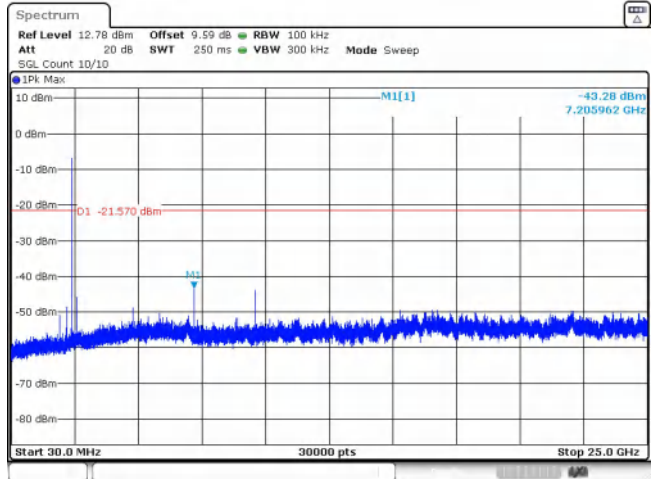
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Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



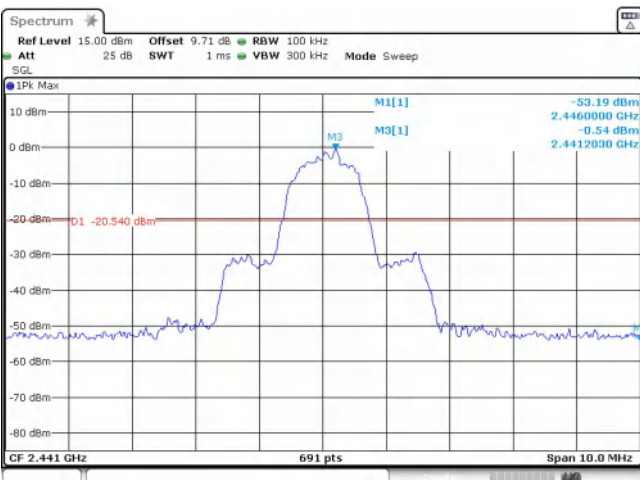
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Out Of Band Emission
8DPSK_3-DH5_Channel 0



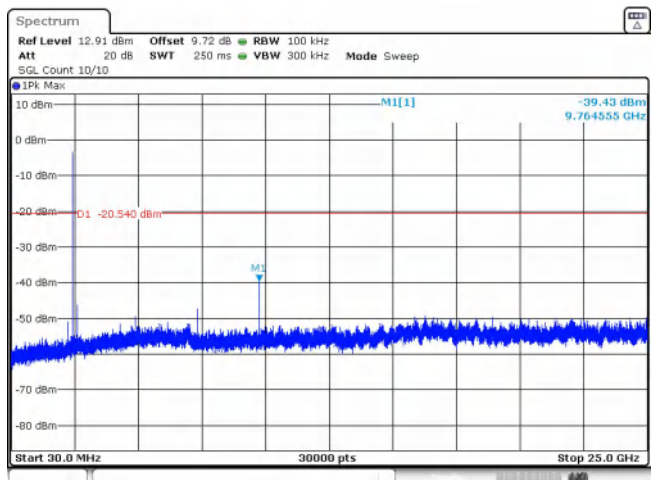
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Spurious Emission
8DPSK_3-DH5_Channel 0



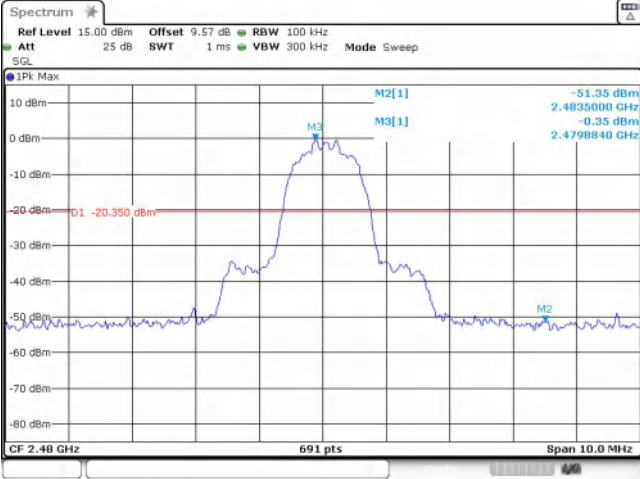
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Out Of Band Emission
8DPSK_3-DH5_Channel 39



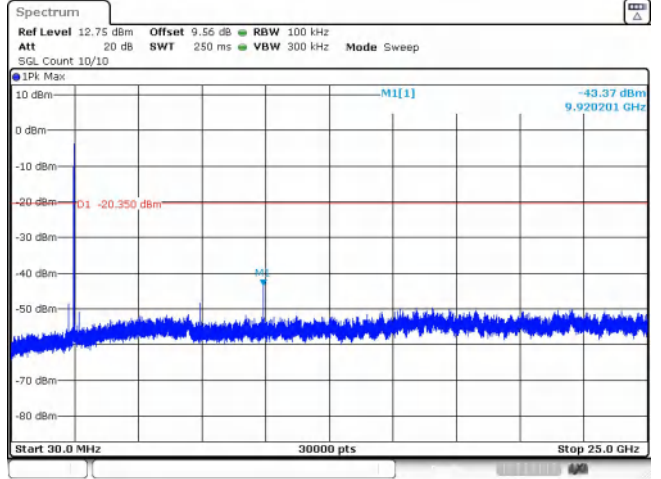
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Spurious Emissions
8DPSK_3-DH5_Channel 39



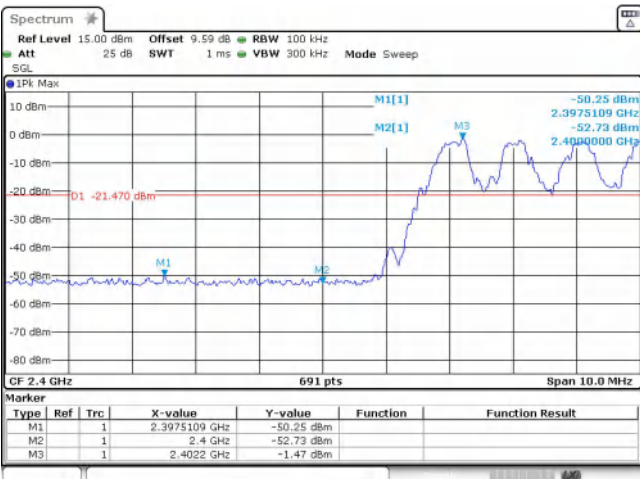
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Out Of Band Emission
8DPSK_3-DH5_Channel 78



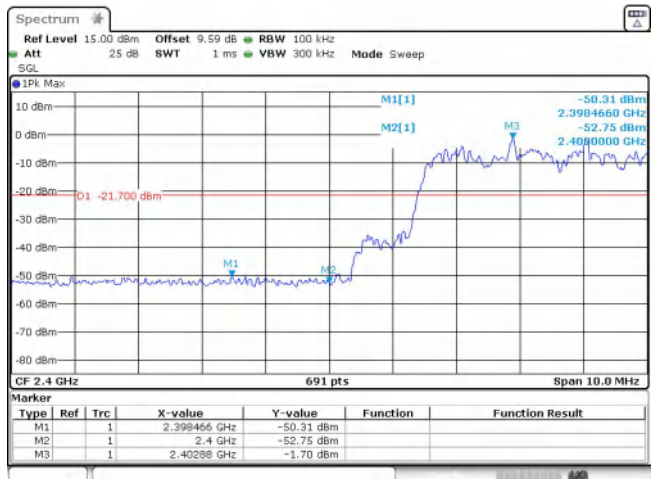
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Spurious Emission
8DPSK_3-DH5_Channel 78



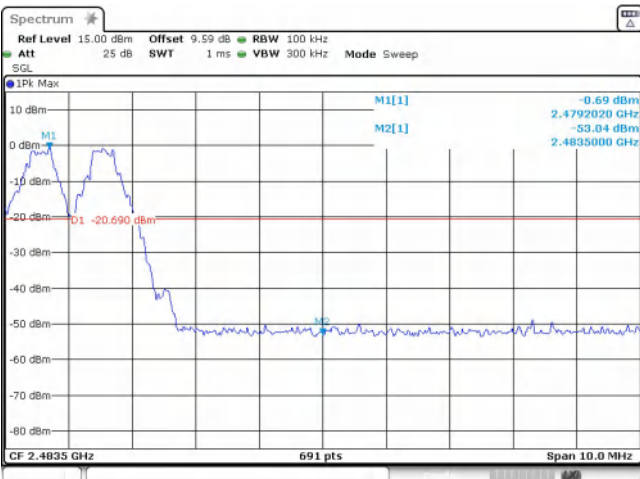
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Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



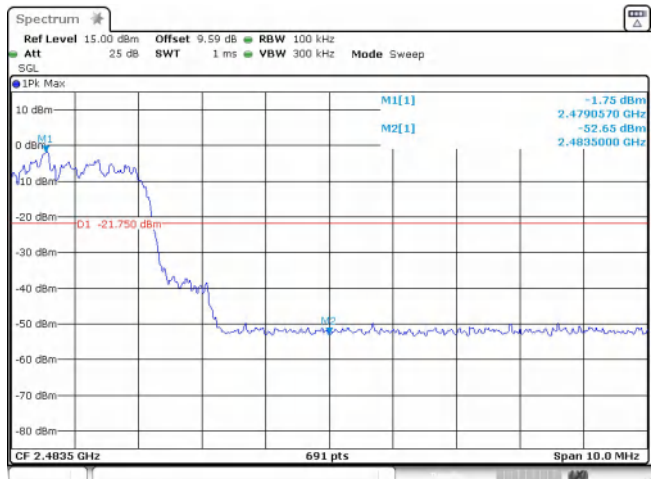
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



Date: 17.JAN.2024 16:17:03

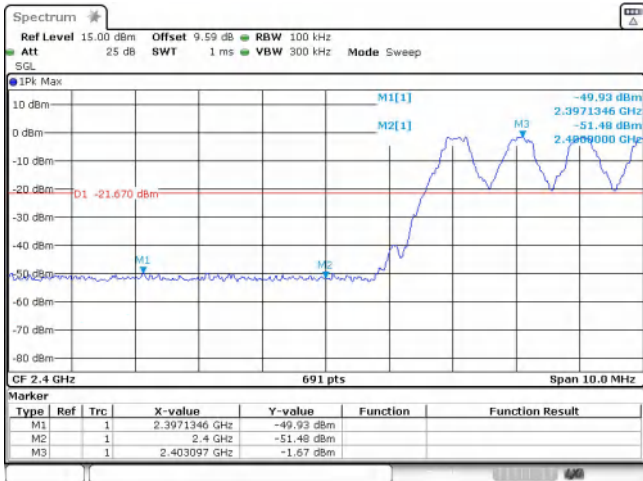
Out Of Band Emission(Right)



Date: 17.JAN.2024 16:41:45

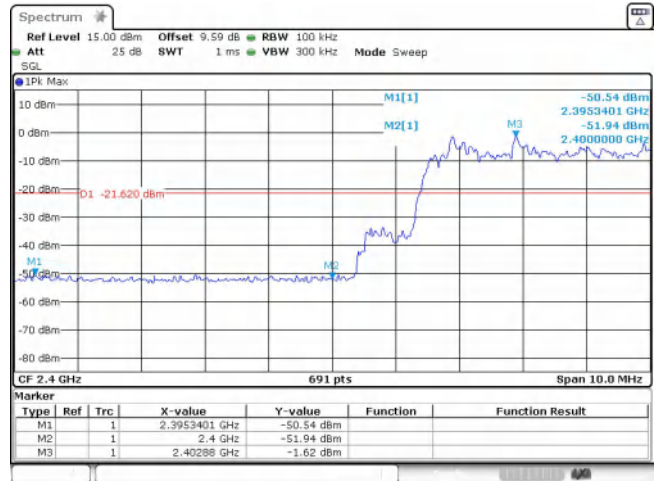
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



Date: 17, JAN, 2024 16:37:08

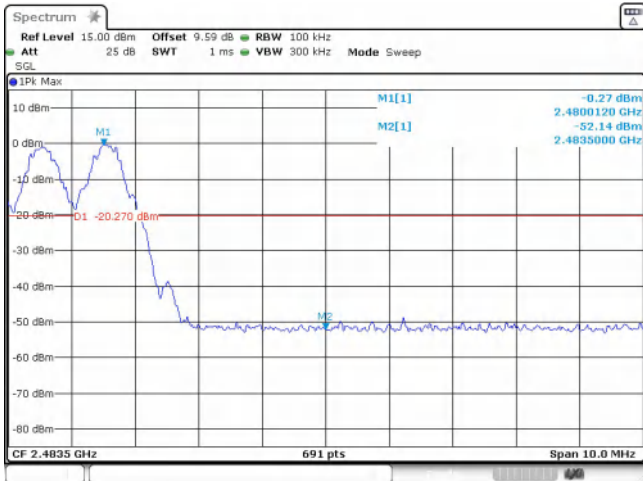
$\pi/4$ DQPSK_2-DH5_Channel Hopping



Date: 17, JAN, 2024 16:42:34

Out Of Band Emission(Left)

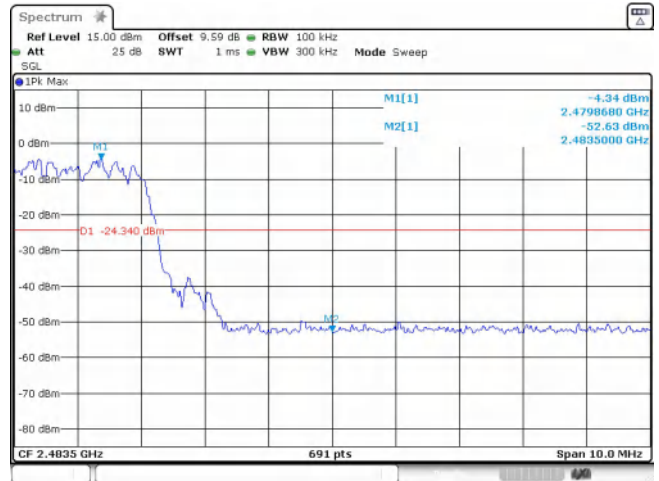
GFSK_DH5_Channel Hopping



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Out Of Band Emission(Left)

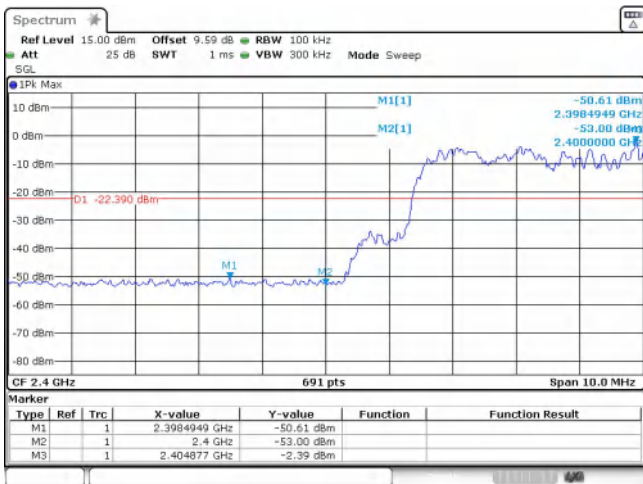
$\pi/4$ DQPSK_2-DH5_Channel Hopping



Date: 17, JAN, 2024 16:42:50

Out Of Band Emission(Right)

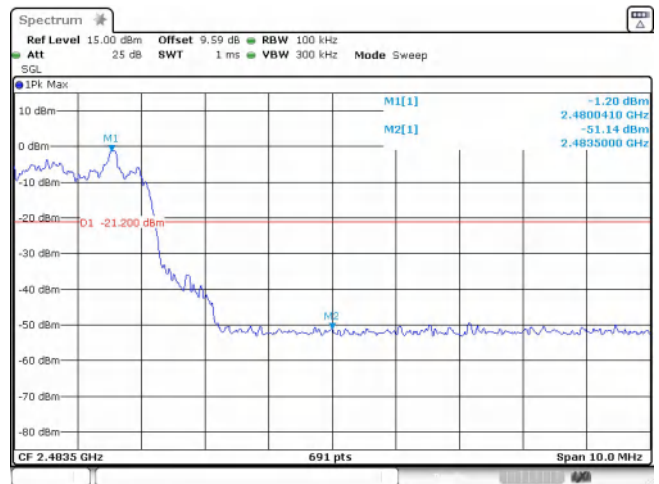
GFSK_DH5_Channel Hopping



Date: 17, JAN, 2024 16:50:20

Out Of Band Emission(Right)

$\pi/4$ DQPSK_2-DH5_Channel Hopping

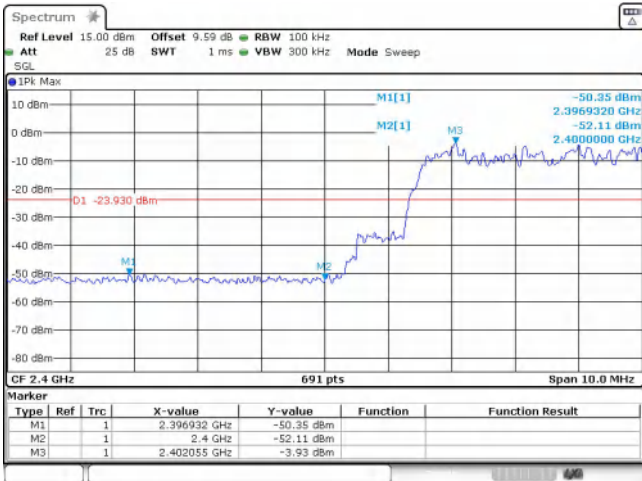


Date: 17, JAN, 2024 16:50:42

Out Of Band Emission(Left)

Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping

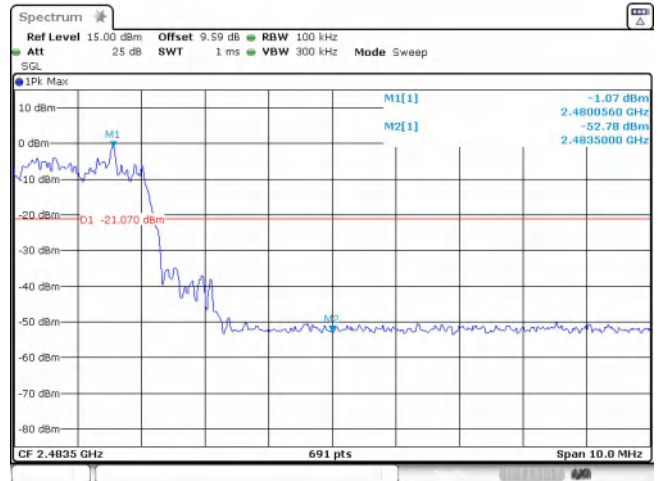


Date: 17.JAN.2024 16:51:28

Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping

8DPSK_3-DH5_Channel Hopping



Date: 17.JAN.2024 16:51:47

Out Of Band Emission(Right)

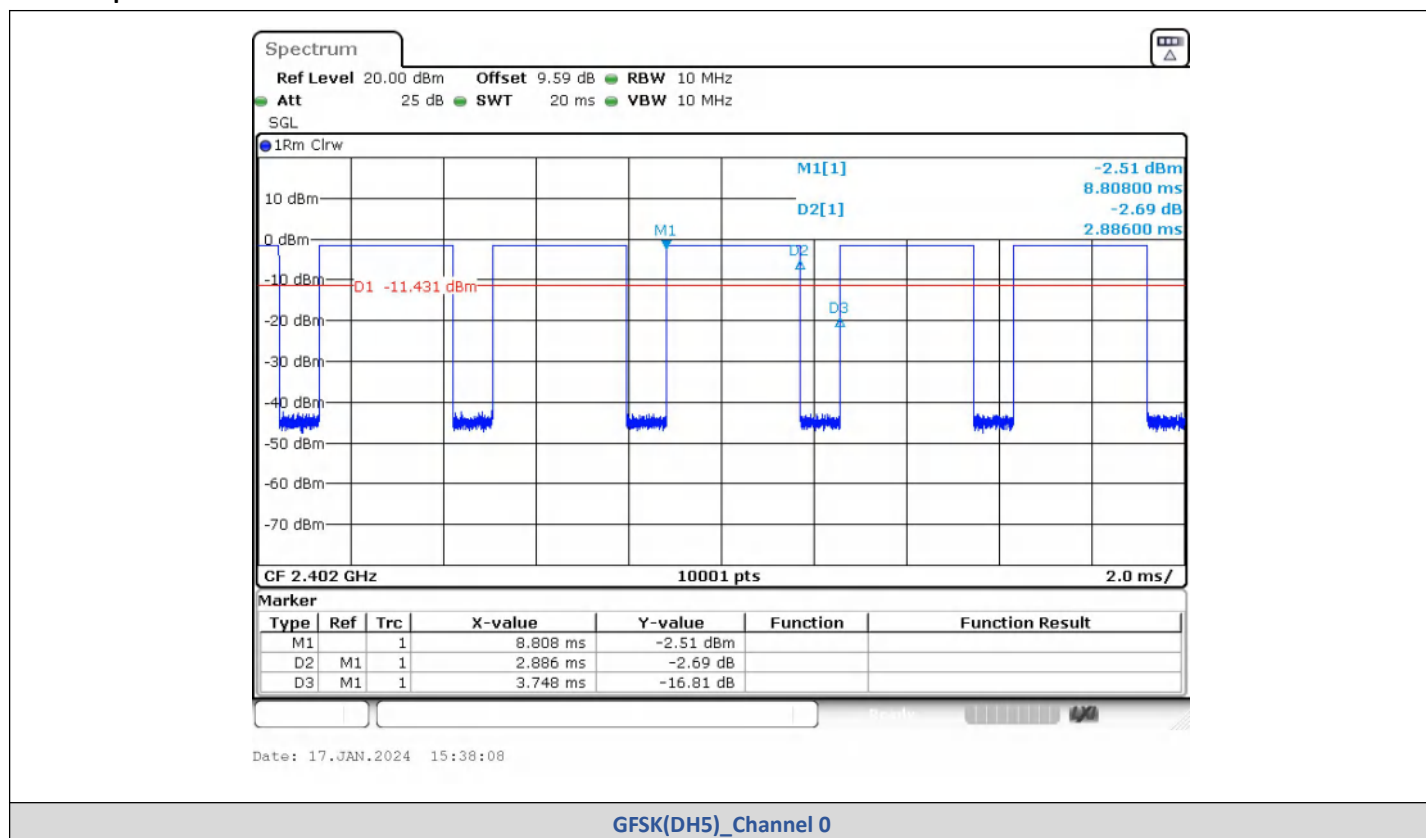
8DPSK_3-DH5_Channel Hopping

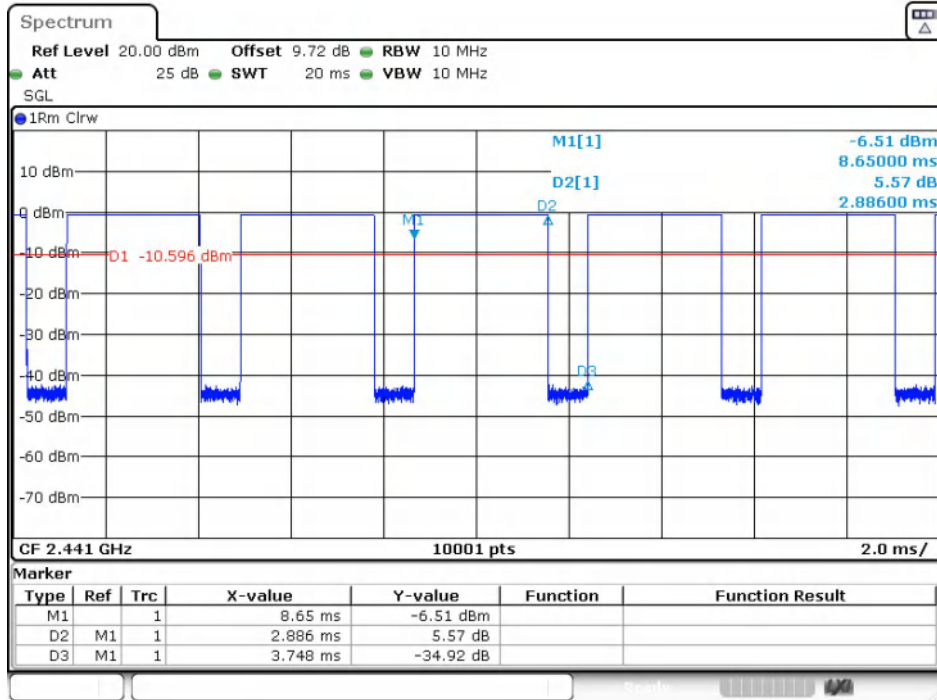
6) Duty Cycle

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35
8DPSK	3-DH5	0	2.892	3.746	77.20	0.7720	1.1238	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.894	3.748	77.21	0.7721	1.1233	0.35

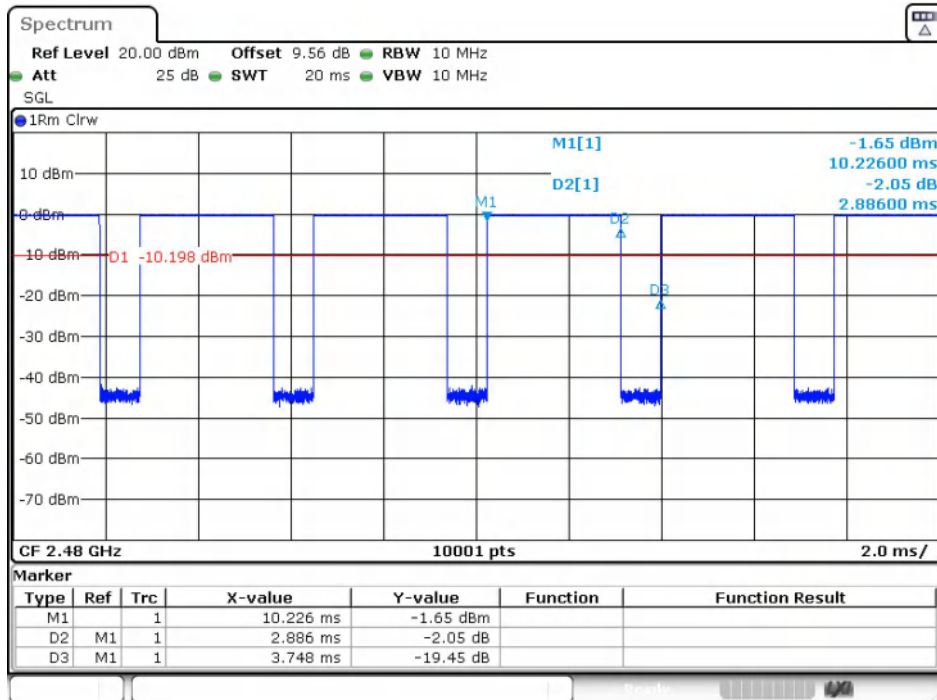
Test Graphs





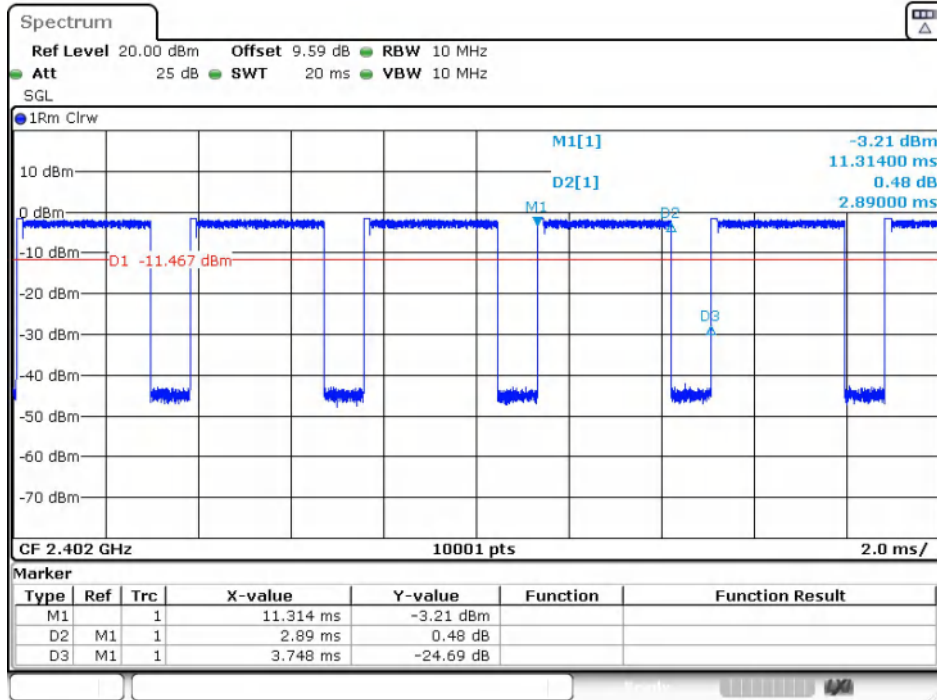
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GFSK(DH5)_Channel 39



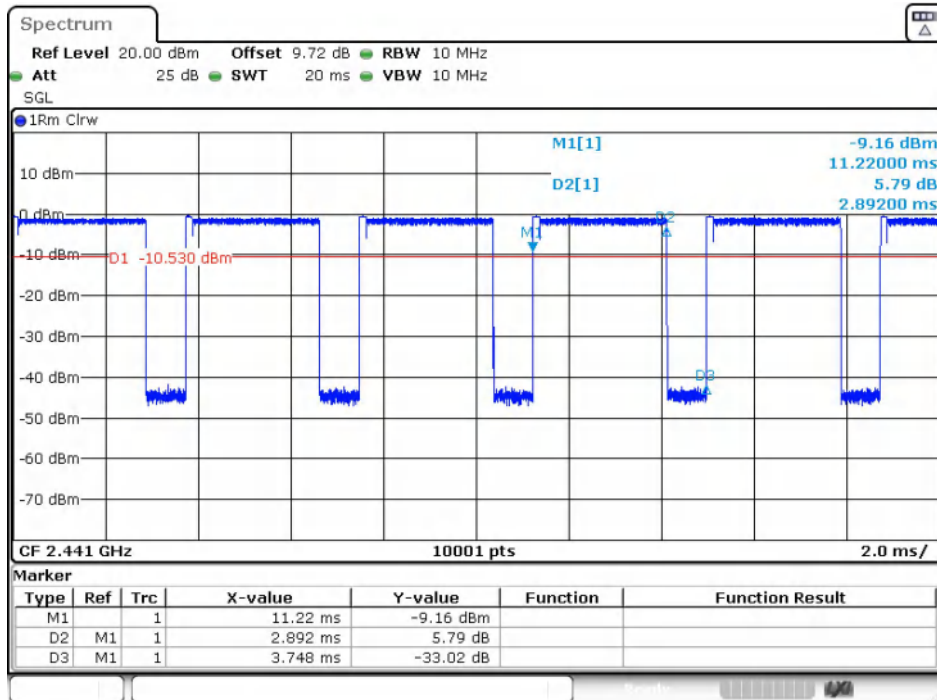
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GFSK(DH5)_Channel 78



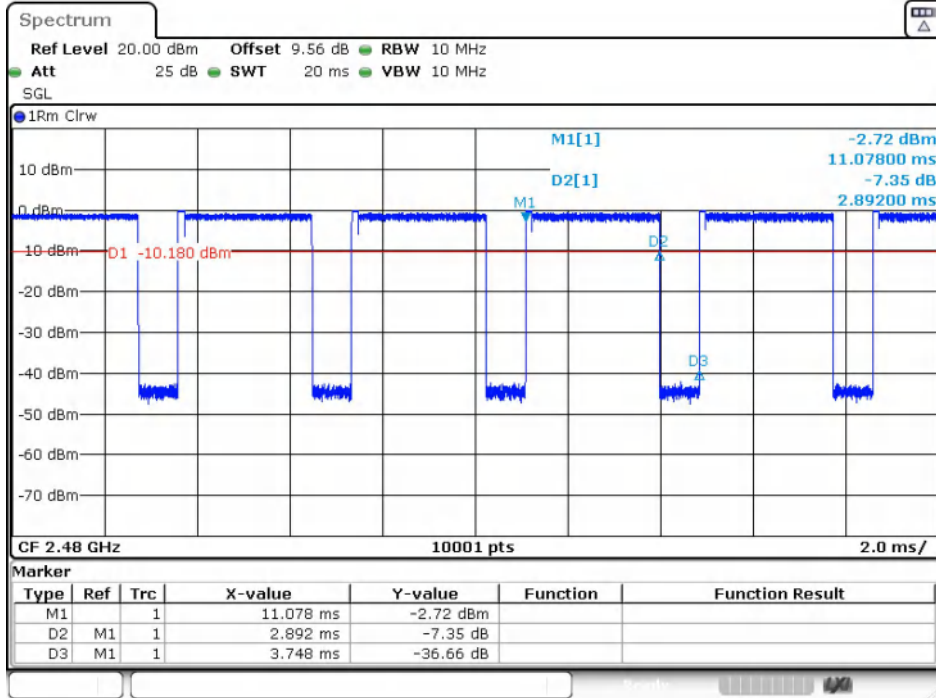
Date: 17.JAN.2024 16:53:36

$\pi/4$ DQPSK(2-DH5)_Channel 0



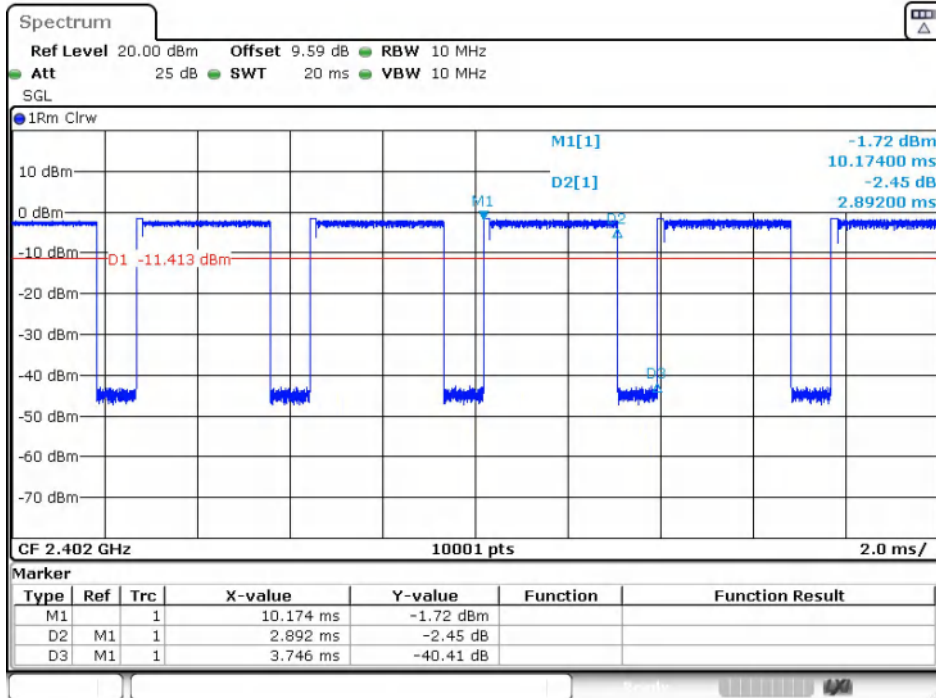
Date: 17.JAN.2024 15:55:38

$\pi/4$ DQPSK(2-DH5)_Channel 39



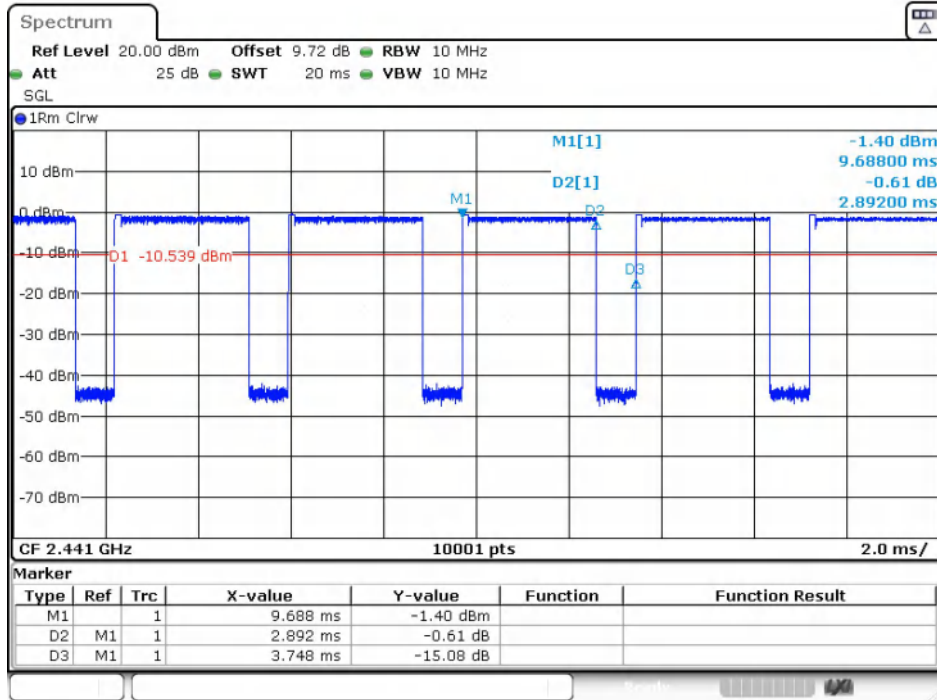
Date: 17.JAN.2024 15:57:36

$\pi/4$ DQPSK(2-DH5)_Channel 78



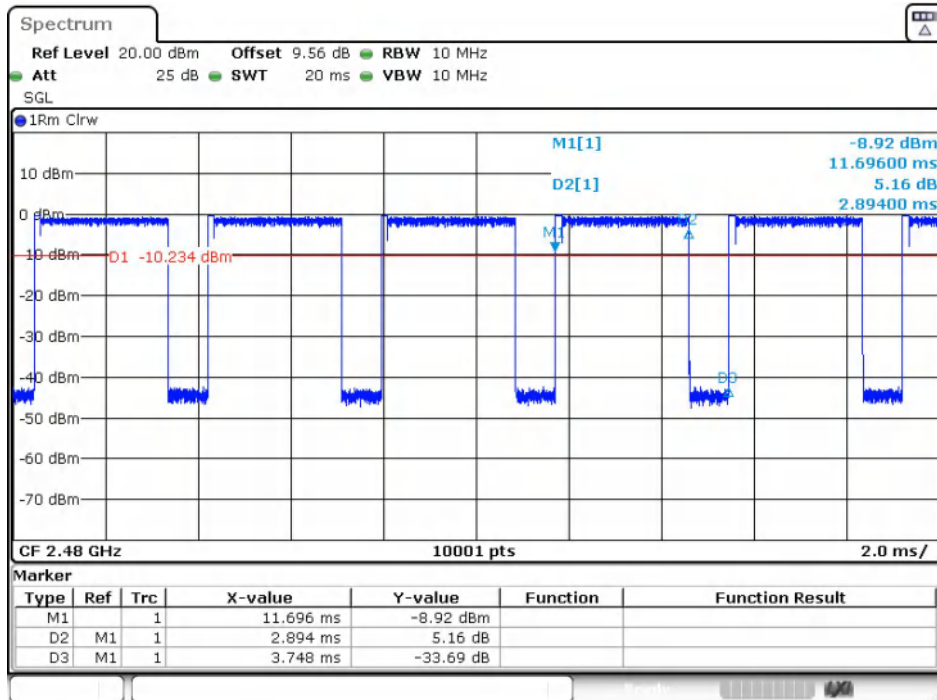
Date: 17.JAN.2024 16:04:06

8DPSK(3-DH5)_Channel 0



Date: 17.JAN.2024 16:06:20

8DPSK(3-DH5)_Channel 39



Date: 17.JAN.2024 16:08:44

8DPSK(3-DH5)_Channel 78

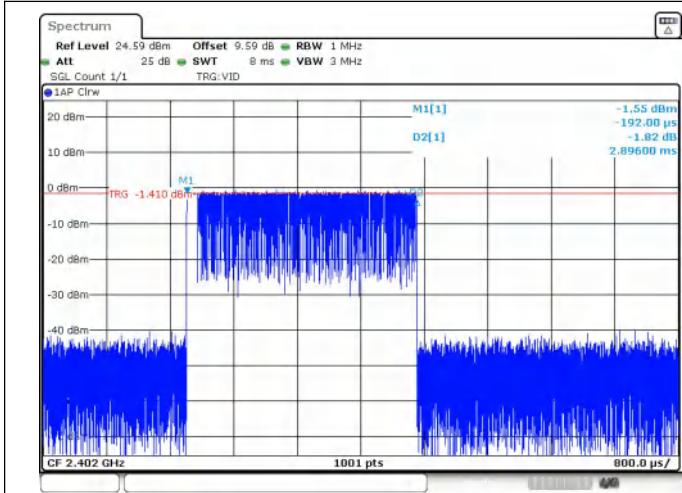
7) Dwell Time

Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CHO (2402MHz)	2.888	114	329.23	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	111	321.46		PASS
8DPSK	3-DH5		2.896	105	304.08		PASS

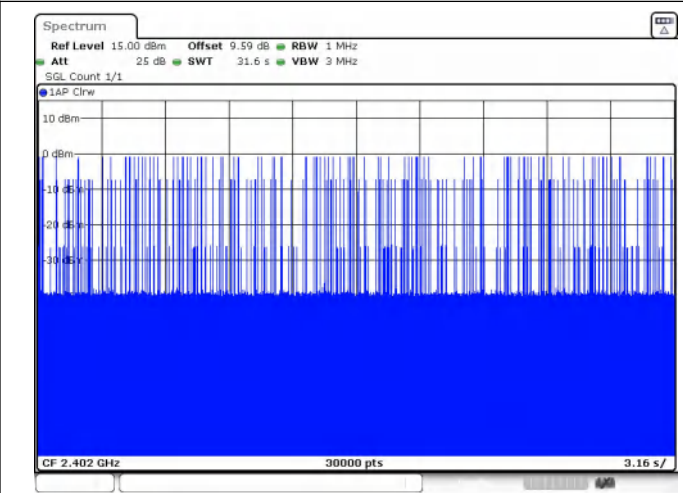
Test Graphs

<p>Date: 17.JAN.2024 16:15:28</p>	<p>Date: 17.JAN.2024 16:15:17</p>
<p>Pulse Width GFSK_DH5</p>	<p>Number of Pulses in 31.6 seconds GFSK_DH5</p>
<p>Date: 17.JAN.2024 16:40:06</p>	<p>Date: 17.JAN.2024 16:39:54</p>
<p>Pulse Width $\pi/4$DQPSK_2-DH5</p>	<p>Number of Pulses in 31.6 seconds $\pi/4$DQPSK_2-DH5</p>



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Pulse Width
8DPSK_3-DH5



Date: 17.JAN.2024 16:46:37

Number of Pulses in 31.6 seconds
8DPSK_3-DH5

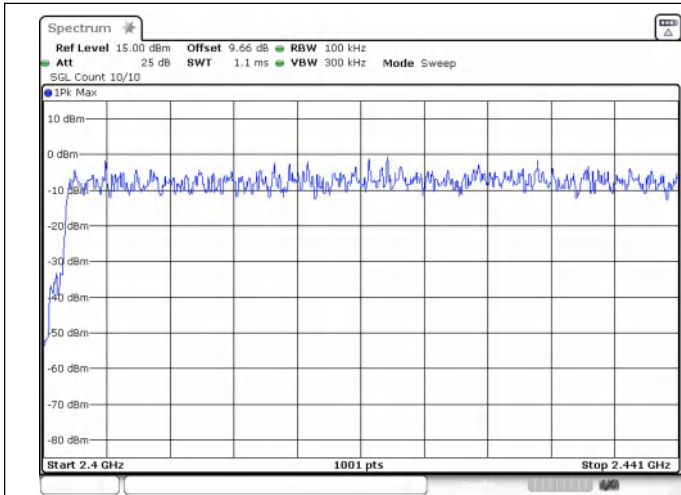
8) Number Of Hopping Channel

Test Result

Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs

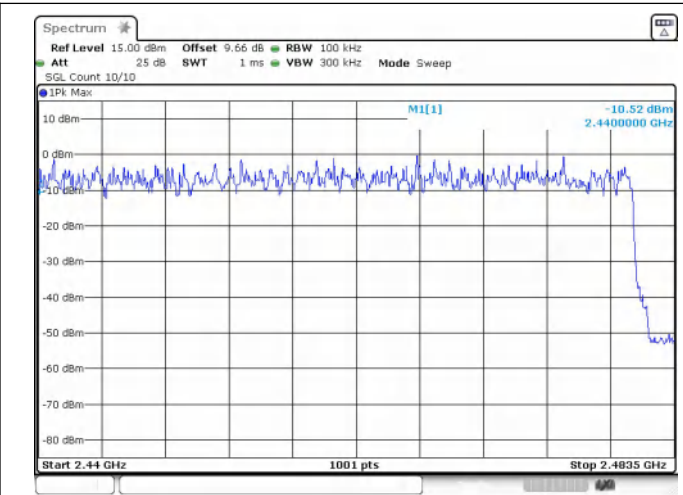
<p>Date: 17.JAN.2024 16:15:58</p>	<p>Date: 17.JAN.2024 16:16:16</p>
<p>Low End Spectrum Channel Hopping Plot GFSK</p>	<p>High End Spectrum Channel Hopping Plot GFSK</p>
<p>Date: 17.JAN.2024 16:40:35</p>	<p>Date: 17.JAN.2024 16:40:58</p>
<p>Low End Spectrum Channel Hopping Plot $\pi/4$DQPSK</p>	<p>High End Spectrum Channel Hopping Plot $\pi/4$DQPSK</p>



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Low End Spectrum Channel Hopping Plot

8DPSK



Date: 17.JAN.2024 16:49:48

High End Spectrum Channel Hopping Plot

8DPSK